

**Belsize Fire Station,**

**London NW3 4HD**

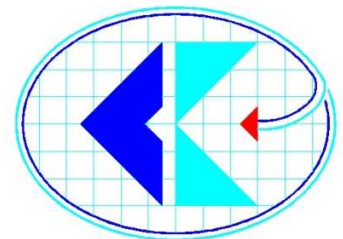
**Client – Vulcan Property**

# **Basement Impact Assessment**

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## **Introduction**

A basement impact assessment (BIA) has been undertaken to satisfy the specific requirements of the 2017 Camden Local Plan, for the site at Belsize Fire Station, London NW3 4HD. Additional partial basements are proposed to the east and west sides along with lowering the existing floor within the fire station. All existing foundations will not be changing.

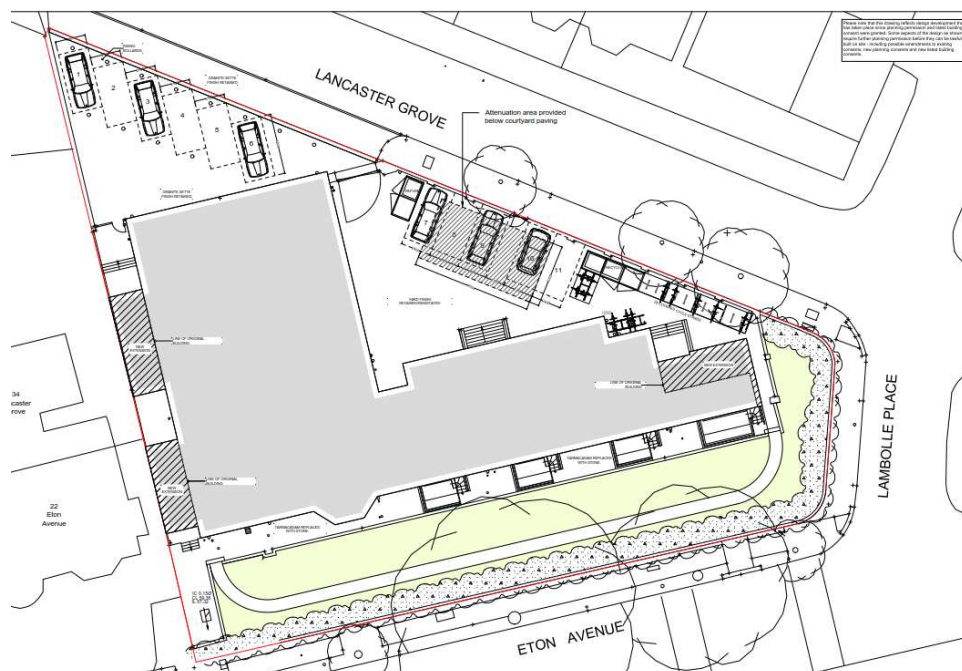
A geotechnical report prepared by LBH Wembley in February 2018 consisted of trial pits within the existing basement levels to confirm existing foundations depths along with the allowable bearing capacity of the ground.

The soil strata consists of made ground to approximately 0.5m bgl which overlies by London Clay Formation, comprising of firm to stiff, initially weathered, pale brown bottled grey silty clay. No ground water was encountered at the time but from historical records a perched water table can exist on top of the clay. Therefore it will be assumed that a water table of 0.5m below ground level for design purposes.

The BIA follows guidance given in the Camden Planning Guidance on Basements and Lightwells CPG4.

## **Existing Site & Structure**

The site is situated in the Belsize Park area of Camden Borough. Refer to site plan below. The site is relatively flat.



**Figure 1: Site Plan**

The building is constructed with thick masonry walls supporting concrete floors and a timber tiled roof. The building is in good structural condition with minimal significant structural defects. Within the existing partial basement, all walls are resting on strip footing which are 1.3m to 1.4m below existing basement floor level.

### **Proposed New Basement Works**

There are 3 main areas of proposed basement works for the development;

1. West Extensions for Units 5 and 6.
2. Lowering of existing basement level to Units 2-4 and the introduction of 3 separate lightwells.
3. New Unit 1 basement to east of site.

Basement levels to Units 1 to 4 will be the same. Foundation depths will match the base of any existing foundations. All basement foundations will be raft slabs which have been designed to counter any uplift. Please refer to structural drawings for all relevant sections.

As the existing foundations are well below the new design levels for the basements, no underpinning is required. All new excavations will be battered back to allow the walls to be constructed.

All retaining walls are designed to resist lateral pressures from soil, ground water and surcharge loading.

Waterproofing methods will be the responsibility of the Architect. It is proposed to use waterproofing concrete along with an internal drained cavity system to protect the basement against water ingress. Any water which seeps through concrete will be collected and pumped to ground level where it will drain into the new gravity drainage system.

### **Screening**

A screening assessment (Stage 1) has been carried out to determine if a full BIA is required. This follows the flow charts set out in CPG4.

### **Subterranean (Groundwater) Flow**

<u>Question</u>	<u>Response</u>	<u>Action</u>
1a. Is the site located directly above an aquifer?	No	None
1b. Will the proposed basement extend beneath the water table surface?	Yes	Pumping of groundwater during construction
2. Is the site within 100m of a watercourse, well, or potential spring line?	No	None
3. Is the site within the catchment of the pond chains on Hapstead Heath?	No	None
4. Will the proposed basement development result in a change in the proportion of hard surfaced/paved areas.	Yes - slightly	Attenuation drainage has been designed to curb the flow of water out onto the public system.
5. As part of site drainage, will more surface water than at present be discharged to ground (e.g. via soakaways and/or SUDS)?	No – no soakaways due to London Clay	None
6. Is the lowest point of the proposed excavation (allowing for any drainage and foundation space under the basement floor) close to, or lower than,	No	None

the mean water level in any local pond or spring lines?		
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### Land Stability

<u>Question</u>	<u>Response</u>	<u>Action</u>
1a. Does the site include slopes, natural or man made, greater than about 1 in 8?	No	None
2. Will the proposed reprofiling of the landscaping at site change slopes at the property boundary to greater than about 1 in 8?	No	None
3. Does the development neighbour land including railway cuttings and the like with a slope about 1 in 8?	No	None
4. Is the site within a wider hillside setting in which the general slope is greater than about 1 in 8?	No	None
5. Is the London Clay the shallowest stratum on site?	No – Made Ground to 0.5m	Incorporated in design
6. Will any trees be felled as part of the proposed development and/or are any works proposed within any tree protection zones where trees are to be retained?	No	None
7. Is there a history of shrink/swell subsidence in the local area and/or evidence of such at the site?	No records.	None
8. Is the site within 100m of a watercourse or a potential spring line?	No	None
9. Is the site within an area of previously worked ground?	No	None
10. Is the site within an aquifer?	No	None
11. Is the site within 50m of the Hampstead Heath Ponds?	No	None
12. Is the site within 5m of a highway or pedestrian right of way?	Yes	The site is surrounded by Eton Avenue, Lambolle Place and Lancaster Grove
13. Will the proposed basement significantly increase the differential depth of foundations relative to neighbouring properties?	No	None
14. Is the site over (or within the exclusion zone of) any tunnels?	No	None

### Surface Flow and flooding screening

<u>Question</u>	<u>Response</u>	<u>Action</u>
1. Is the site within the catchment of the pond chains on Hampstead Heath?	No	None
2. As part of the proposed site drainage, will surface water flows (e.g. volume of rainfall and	No	Attenuation drainage has been designed to curb the flow of water

peak run-off) be materially changed from the existing route?		out onto the public system and limit flooding.
3. Will the proposed basement development result in a change in the proportion of hard surfaced / paved external areas?	No	As above
4. Will the proposed basement result in changes to the profile of the inflows (instantaneous and long-term) of surface water being received by adjacent properties or downstream watercourses?	No	As Above
5. Will the proposed basement result in changes to the quality of surface water being received by adjacent properties or downstream watercourses?	No	None
6. Is the site in an area known to be at risk from surface water flooding, or is it at risk from flooding, for example because the proposed basement is below the static water level of a nearby surface water feature?	No	None

### **Scoping**

#### **Subterranean (Groundwater) Flow**

During excavation of trial holes within the basement, no ground water was found down to the new basement level. It is however advised due to seasonal changes, that any basement structures are designed with a ground water level of 0.5m below ground level.

If ground water is encountered during excavation, the groundwater is to be pumped.

#### **Land Stability**

In the area where new basement construction is located, there will be no impact to neighbouring trees. The development is outside the zone of influence. Any effects from heave on the basement slabs will be minimised of the use of mass concrete raft slabs which will transfer the load and reduce the effects of any uplift.

The maximum height of retaining walls for the development is 2m which is sufficiently enough away from any public roads. All retaining walls have been designed for the appropriate surcharge loading which will maintain the stability of the surrounding soils.

#### **Surface Flow and flooding screening**

The use of infiltration techniques (soakaways) cannot be considered for this site due to the presence of London Clay at 0.5m below ground level. There is also no provisions for rainwater tanks and the absence of ponds or open water features indicate that the next option is to store water for gradual release. A system of storing the water using Attenuation Storage (tanks, pipes etc) is to be considered.

Both the new surface water and foul systems are to both be discharged to an existing manhole at the front of Lancaster Grove. The depth of the manhole has been confirmed (4.0m + deep from

cover level) which gives sufficient depth to gravity feed the new surface water system to the public works.

The new attenuation system will consist of Aquacell crates which will have a combined volume of 71m<sup>3</sup>. They will be placed under the proposed driveway/carpark. A manhole will be constructed with a flow control device to limit the sites discharge out to the public sewer to 5.0l/s.

The proposed Aquacell crate system will include arrangements for ongoing maintenance based on the manufacturer's recommendation. This will allow access to undertake any necessary works over the life-time of the development including system monitoring, inspection, routine and remedial maintenance.